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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/023,689

12/21/2001

Makoto Ogusu

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09/02/2004

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 09/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/023,689

Applicant(s)

OGUSU ET AL.

Examiner

Arnel C. Lavarias

Art Unit

2872



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/09/04, 6/14/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-3 and 17-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-6, 16 and 31-37 is/are rejected.
- 7) ☒ Claim(s) 7-15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/14/04 has been entered.

Election/Restrictions

2. Claims 1-3, 17-30 are again withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions and species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 7/14/03.

Response to Amendment

3. The amendments to Claim 4 in the submission dated 6/14/04 are acknowledged and accepted.

Response to Arguments

4. The Applicants' arguments, see in particular Pages 10-11 of Applicants' remarks, filed 6/24/04, with respect to the rejection of Claims 4-16, 31-37 have

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been fully considered and are persuasive. The rejections of Claims 4-16, 31-37 in Section 7 of the Office Action dated 3/9/04 have been withdrawn.

5. Claims 4-16, 31-37 are now rejected as follows.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 4-6, 16, 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Brown et al. (U.S. Patent No. 6613498), of record.

Brown et al. discloses a method of manufacturing a diffractive optical element (See for example Figure 2) by transferring a mask pattern to a workpiece, comprising defining a shape of a vertical portion of the diffractive optical element by use of a first mask (See for example 220 in Figure 2(a)); defining a shape of a slant portion of the diffractive optical element by transferring a shape of a surface of a second mask (See for example 250 in Figure 2(b)) and in a processing region determined by the first mask, wherein the surface of the second mask is tilted obliquely, and wherein the shape of the slant portion of the diffractive optical element is determined by the transferred shape of the surface of the second mask

(See 250, 240 in Figures 2(b)-(c)). Brown et al. additionally discloses the shape of the vertical portion of the diffractive optical element being defined by transferring an edge portion of the first mask (See 220 in Figure 2(a)); the processing region being a region determined by transferring the edge portion of the first mask (See 220 in Figure 2(a)); and the second mask being a resist (See 250 in Figure 2(b); col. 4, lines 46-62). Brown et al. additionally discloses a diffractive optical element manufactured in accordance with the method (See col. 9, lines 15-33); and the first mask being made of a first and second material (See 220, 230 in Figure 2(a); col. 4, lines 30-46).

8. Claims 4-6, 16, 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Vlannes (U.S. Patent No. 5004673).

Vlannes discloses a method of manufacturing a diffractive optical element (See for example Figures 4-5) by transferring a mask pattern to a workpiece, comprising defining a shape of a vertical portion of the diffractive optical element by use of a first mask (See for example 1 in Figure 4a); defining a shape of a slant portion of the diffractive optical element by transferring a shape of a surface of a second mask (See for example 2 in Figure 4b) and in a processing region determined by the first mask, wherein the surface of the second mask is tilted obliquely, and wherein the shape of the slant portion of the diffractive optical element is determined by the transferred shape of the surface of the second mask (See 2, 3 in Figures 4-5). Vlannes additionally discloses the shape of the vertical portion of the diffractive optical element being defined by transferring an edge portion of the first mask (See 1 in Figure 4a); the processing region being a region

determined by transferring the edge portion of the first mask (See 1 in Figure 4a); and the second mask being a resist (See 2 in Figure 4b; col. 5, line 49-col. 6, line 61). Vlannes additionally discloses a diffractive optical element manufactured in accordance with the method (See col. 1, lines 11-20), and an optical system and instrument using such a diffractive optical element (See col. 1, lines 11-20).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 31, 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al. in view of Iwasaki et al. (U.S. Patent No. 6475704), of record.

Brown et al. discloses the invention as set forth above in Claims 4 and 32, except for a mold, optical instrument and exposure apparatus with the diffractive optical element, and device manufacturing method and device manufactured in accordance with the method. However, the use of such a fabrication method for producing a mold or for producing a diffractive optical element that is to be used in, for instance, an optical system, optical instrument, or exposure apparatus for device manufacturing is apparent and well known in the art. For example, Iwasaki et al. discloses an alternative method for forming a diffractive optical element (See for example Figures 1, 2, 8, 14-15) by transferring a mask pattern to

a workpiece, and further discloses that a mold, diffractive optical element, optical instrument and exposure apparatus with the diffractive optical element, and device manufacturing method and device may be manufactured in accordance with the alternative method (See for example Figures 1, 2, 5-11; col. 7, lines 30-45; col. 7, line 64-col. 11, line 25). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the method of Brown et al. be used to manufacture a mold, optical instrument and exposure apparatus with the diffractive optical element, and device manufacturing method and device, as similarly taught by Iwasaki et al., for the purpose of producing diffractive optical elements that inherit the advantages gained from the manufacturing method, such as the ability to produce a continuously variable surface relief.

11. Claims 31, 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vlannes in view of Iwasaki et al.

Vlannes discloses the invention as set forth above in Claims 4 and 32-34, except for a mold, and exposure apparatus with the diffractive optical element, and device manufacturing method and device manufactured in accordance with the method. However, the use of such a fabrication method for producing a mold or for producing a diffractive optical element that is to be used in, for instance, an exposure apparatus for device manufacturing is apparent and well known in the art. For example, Iwasaki et al. discloses an alternative method for forming a diffractive optical element (See for example Figures 1, 2, 8, 14-15) by transferring a mask pattern to a workpiece, and further discloses that a mold, diffractive

optical element, optical instrument and exposure apparatus with the diffractive optical element, and device manufacturing method and device may be manufactured in accordance with the alternative method (See for example Figures 1, 2, 5-11; col. 7, lines 30-45; col. 7, line 64-col. 11, line 25). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the method of Vlannes be used to manufacture a mold, optical instrument and exposure apparatus with the diffractive optical element, and device manufacturing method and device, as similarly taught by Iwasaki et al., for the purpose of producing diffractive optical elements that inherit the advantages gained from the manufacturing method, such as the ability to produce a continuously variable surface relief.

Allowable Subject Matter

12. Claims 7-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter:

Claim 7 is allowable over the cited art of record for at least the reason that the cited art of record fails to teach or reasonably suggest the method of manufacturing a diffractive optical element by transferring a mask pattern to a workpiece, as generally recited in Claim 4, the method including, in combination, after a first processing region determined by the first material is processed, the

first processing region is covered by the second material and, subsequently, the first material is removed, and wherein while using a portion from which the first material has been removed as a second processing region, the first processing region determined by the first material is replaced by the second material to cause a processing region inversion. Claims 8-12 are dependent on Claim 7, and hence are allowable over the cited art of record for the same reasons Claim 7 is allowable.

Claim 13 is allowable over the cited art of record for at least the reason that the cited art of record fails to teach or reasonably suggest the method of manufacturing a diffractive optical element by transferring a mask pattern to a workpiece, as generally recited in Claim 4, the method including, in combination, wherein light is transmitted through the workpiece made of a light transmitting material, from behind thereof, thereby to cause reaction of the negative resist, wherein a processing region determined by the first material is covered by a negative resist and thereafter, hard baking is carried out, and wherein the first material is removed to cause inversion of the processing region. Claims 14-15 are dependent on Claim 13, and hence are allowable over the cited art of record for the same reasons Claim 13 is allowable.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is

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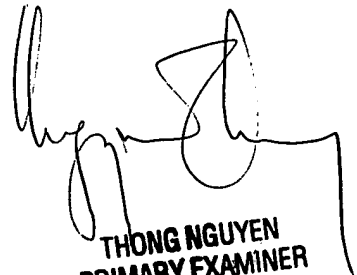
571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnel C. Lavarias
8/30/04



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